

WHAT IS CLAIMED IS:

1. An electrochemical cell comprising an anode comprising anode active material, an aqueous alkaline electrolyte solution, a separator, and a cathode comprising copper iodate.

2. The cell of claim 1 wherein the cathode comprises copper iodate and a portion of said aqueous alkaline solution.

3. The cell of claim 1 wherein the anode active material comprises zinc.

4. The cell of claim 1 wherein the electrolyte solution comprises potassium hydroxide.

5. The cell of claim 1 wherein the cathode further comprises graphitic carbon.

6. The cell of claim 5 wherein the graphitic carbon comprises expanded graphite.

7. The cell of claim 5 wherein the graphitic carbon comprises graphitic carbon nanofibers having a diameter less than 500 nanometers.

8. The cell of claim 7 wherein said carbon nanofibers have a mean average diameter between about 50 and 300 nanometers.

9. The cell of claim 8 wherein said carbon nanofibers have a mean average length between about 0.5 and 300 micron.

10. The cell of claim 1 wherein the cathode comprises a mixture comprising copper iodate and sulfur.

11. The cell of claim 10 wherein the sulfur comprises between about 5 and 10 percent by weight of said cathode.

12. The cell of claim 5 wherein the graphitic carbon comprises between 4 and 10 percent by weight of the cathode.

13. The cell of claim 1 wherein the cathode comprises between about 82 and 90 percent by weight copper iodate.

14. The cell of claim 1 wherein the copper iodate is in particulate form having an average particle size between about 1 and 100 micron.

15. The cell of claim 1 wherein said cell comprises less than 50 parts by weight mercury per million parts total cell weight.

16. The cell of claim 7 wherein the graphitic carbon nanofibers comprise less than 200 parts by weight metal per million parts carbon.

17. An electrochemical cell comprising an anode comprising anode active material, an aqueous alkaline electrolyte solution, a separator, and a cathode comprising copper iodate and sulfur.

18. The cell of claim 17 wherein the sulfur comprises between about 5 and 10 percent by weight of said cathode.

19. An electrochemical cell comprising an anode comprising anode active material, an aqueous alkaline electrolyte solution, a separator and a cathode comprising copper iodate and graphitic carbon nanofibers.

20. The cell of claim 19 wherein said carbon nanofibers have a mean average diameter between about 50 and 300 nanometers.

21. The cell of claim 19 wherein the graphitic carbon nanofibers comprises between about 4 and 10 percent by weight of said cathode.

22. The cell of claim 19 wherein the graphitic carbon nanofibers comprise less than 200 parts by weight metal per million parts carbon.